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XXXVIII.—*New African Phlebotomic Diptera in the British Museum (Natural History).*—Part VII. Tabanidæ (*continued*). By ERNEST E. AUSTEN*.

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PANGONIINÆ.

DORCALÆMUS †, gen. nov.

Agreeing with Pangonia, Latr. (sensû stricto), except that in the wings the fourth as well as the first posterior cell is closed before reaching the margin, and that the wings themselves, instead of tapering to the distal extremity, are more bluntly rounded at the tips, thus having a characteristic shape, which, by comparison with that seen in, e. g., Pangonia rostrata, Linn., is relatively short and broad. Ocelli wanting. Face in both sexes without a shining callus on each side.

Typical species, *Pangonia compacta*, Austen (Ann. & Mag. Nat. Hist. ser. 8, vol. i. p. 212 (1908); 'Illustrations of African Blood-sucking Flies,' p. 61, pl. iv. fig. 28 (1909):—Southern Rhodesia and Nyasaland Protectorate).

* See Ann. & Mag. Nat. Hist. ser. 8, vol. iii. p. 280 (1909).

† *Dorcalæmus*=a plague to antelopes (δορκάς, an antelope; λοιμός, a plague or pest).

Up to the present time the species belonging to this new genus, which is sufficiently characterized in the foregoing diagnosis, have been met with only in South Central Africa. In addition to the typical species, *Pangonia compacta centralis*, Austen (Ann. & Mag. Nat. Hist. *loc. cit.* p. 214:—Nyasaland Protectorate), and *P. fodiens*, Austen (*ibid.* p. 215:—Nyasaland Protectorate), also belong to *Dorcalæmus*.

From the South-American genus *Scione*, Walk., in which the fourth posterior cell is likewise closed, *Dorcalæmus* is distinguished by its species having bare eyes and a very different *facies*.

Dorcalæmus bicolor, sp. n.

♂.—Length (1 specimen) 13·5 mm.; width of head 4·25 mm.; distance from upper margin of occiput to anterior extremity of face 3·25 mm.; length of proboscis 5·2 mm.; greatest width of abdomen (base of second segment) 5 mm.; length of wing 9·6 mm.; greatest width of wing 3·6 mm.

A slenderly built species, with (at least in the ♂) relatively narrow tapering abdomen.—Face short, but little prominent, yellowish-white pollinose, lower part of sides clove-brown; thorax olive, yellowish pollinose; first three segments of abdomen buff on dorsum, cream-coloured below, remainder of abdomen clove-brown, on dorsal surface an area on first segment immediately beneath scutellum and a median basal spot on second segment also clove-brown; wings with a light sepia tinge; femora, except extreme tips, clove-brown or black, tibiae, tarsi, and extreme tips of femora cream-buff, last two joints of all tarsi and tips of remaining tarsal joints brown or brownish.*

Head: upper part of sides of face and basi-occipital region clothed with pale yellowish hair; *palpi* clove-brown, terminal joint curved and very slender; *proboscis* black; first and second joints of *antennæ* clothed with black hairs, first joint blackish, grey pollinose, second joint buff, third joint ochraceous-rufous, somewhat brownish at tip. *Thorax*: dorsum, including scutellum, clothed with bright Naples-yellow hair, mixed with dark brown hair, especially on anterior portion of dorsum and on hind margin of scutellum; pollinose covering on sides of dorsum lighter than that on disc of dorsum; *pleuræ* clothed with pale yellowish hair, a tuft of black hair immediately in front of and below base of wing.

* For names and illustrations of colours, see Ridgway, 'A Nomenclature of Colors for Naturalists' (Boston: Little, Brown, & Company, 1886).

Abdomen: dorsum clothed with black hair, second and third segments each with a band of pale, shining, whitish-yellow hair on hind border; ventral surface of second and third segments clothed with shining whitish-yellow hair and with a patch of black hair in each anterior angle; venter clothed elsewhere with black hair. *Wings*: stigma ochre-yellow, veins ochraceous, fourth and sixth and distal extremities of other longitudinal veins brown. *Squamæ* buff. *Halteres* cream-buff, stalks ochraceous-buff. *Legs*: femora, tarsi, anterior surfaces of front and hind tibiæ and of distal extremities of middle tibiæ clothed with black hair, legs elsewhere clothed with pale yellowish hair.

Nyasaland Protectorate: Zomba District, 1909 (*Dr. S. K. Norris*).

So far, at any rate, as may be judged from the male, *Dorcalæmus bicolor*, owing to its coloration and narrow and elongate body, is readily distinguishable from any other species of its genus at present described.

Genus PANGONIA, Macq.

Pangonia bubsequa, sp. n.

♀.—Length (2 specimens) 16 to 17·2 mm.; width of head 5·2 to 5·8 mm.; width of front at vertex just under 1 mm.; distance from upper margin of occiput to anterior extremity of face 4·4 to 4·6 mm.; length of proboscis 7·2 to 9 mm.; length of wing 14 to 16·4 mm.; greatest width of wing 5 to 5·6 mm.

Allied to Pangonia oldii, Austen, from which it may be distinguished by the tawny-ochraceous area on the dorsum of the abdomen being confined to the first (i. e. first visible) segment, which contrasts sharply with the following segments in colour, and by the absence of a (more or less complete) transverse band of silvery-white hair on the hind borders of the second and fourth abdominal segments.—Thorax olive-brown, dorsum when viewed at a low angle from behind appearing dull saffron-yellow pollinose; first (visible) segment of abdomen tawny-ochraceous, second segment dark mummy-brown, third to sixth segments inclusive clove-brown, sixth and seventh segments yellowish pollinose and clothed with Naples-yellow hair, lateral margins of fourth and fifth segments and hind border of fifth segment (more or less completely) clothed with yellowish hair; wings brownish, extreme base and costal cells mummy-brown; femora dark brown at base, then chestnut or

cinnamon-rufous, front and middle tibiæ buff, front and middle tarsi ochraceous-buff, hind tibiæ and tarsi chestnut.

Head buff pollinose, lower part of sides of face mummy-brown; shining black callus on each side of face oblong, widely separated from front margin of buccal cavity; ocellar spot shining dark brown, more or less quadrate, not reaching eye on each side; a dark patch in centre of front, connected below with an elongate reddish-brown callus between and above bases of antennæ; jowls and basi-occipital region clothed with yellowish-white hair; *palpi* and *antennæ* cinnamon-rufous, first and second joints of antennæ greyish pollinose, first joint clothed with yellowish, second joint for most part with long blackish hairs. *Thorax*: dorsum viewed vertically from above showing traces of three narrow, raw-sienna-coloured, longitudinal stripes on median third; dorsum, including scutellum, clothed with short, erect, Naples-yellow hair, which immediately in front of pre-scutellar groove is mixed with blackish hair in middle line; longer hair on each side, on upper margin of mesopleura, above base of wing, and on postalar callus yellowish white; pleuræ clothed with yellowish hair; a small tuft of black hair beneath base of wing on each side. *Abdomen* very convex above; first (first visible) segment blackish beneath scutellum, elsewhere clothed with ochraceous hair, with some pale straw-yellow hairs on each side of middle line in front of hind margin; second segment in case of type lighter in middle than at sides, with a few yellow hairs on each posterior angle, visible only from the side; hind border of fifth segment and that of fourth except on each side dull, more or less yellowish pollinose; second to fifth segments inclusive clothed, except where already stated to the contrary, with short black hair; some black hairs also among the yellow hairs on sixth segment; venter clothed for most part with short black hair, fifth and following segments clothed with yellowish hair. *Squamæ* buff. *Halteres*: stalk brownish, knob ochraceous-buff. *Legs*: front coxæ clothed on anterior surface with yellowish-white hair; femora, hind tibiæ, and upper surface of hind tarsi clothed with black hair; front and middle tibiæ and upper surface of front and middle tarsi clothed with Naples-yellow or ochraceous hair; tarsi clothed beneath with bright ochraceous-rufous hair.

Nyasaland Protectorate and North-Eastern Rhodesia: type from Kapemba Valley, Luviri River, Akamanga, North Nyasa, 4. v. 1909, "biting cattle" (*Dr. J. B. Davey*); a second specimen (in possession of the Hope Department, Oxford University Museum) is from the Loangwa Valley,

N.-E. Rhodesia, 12-20 miles west of Petauke, 1700 ft.,
8. iv. 1905 (*S. A. Neave*).

Pangonia concitans, sp. n.

♀.—Length (2 specimens) 10·4 to 11·5 mm.; width of head 3·6 to 3·8 mm.; width of front at vertex 0·6 mm.; distance from upper margin of occiput to anterior extremity of face 2·8 to 3 mm.; length of proboscis 4 mm.; length of wing 10 to 11·25 mm.; greatest width of wing 4 mm.

Allied to and in appearance somewhat resembling Pangonia rüppellii, Jaenn.—*Thorax* olive, *dorsum* dull saffron-yellow pollinose, clothed with ochre-yellow hair; *abdomen* ochraceous, fourth, fifth, and sixth segments each with a clove-brown transverse band on *dorsum*, third segment with a dark brown spot or blotch in middle line, second and following segments each with a buff-yellow pollinose band, clothed with appressed chrome-yellow hair, on hind border; wings light mummy-brown; femora, except extreme tips, dark brown (seal-brown to clove-brown), tarsi, tibiae, and extreme tips of femora ochraceous-buff.

Head yellowish pollinose; face short, only moderately prominent; a shining, seal-brown, roughly quadrate spot on each side of face, next eye; a transverse somewhat rhomboid callus below antennae, and an elongate callus on upper half of front, not extending to upper margin of occiput, shining black; jowls and basi-occipital region clothed with yellowish-white hair; palpi cinnamon-rufous or chestnut; proboscis clove-brown, relatively stout; antennae ochraceous-rufous, first and second joints yellowish pollinose, clothed with yellowish hair, third joint fairly broad at base. *Thorax*: pleurae clothed with straw-yellow hair. *Abdomen*: *dorsum* of first (first visible) segment clove-brown beneath scutellum; clove-brown transverse bands clothed with black hair, remainder of *dorsum* clothed with chrome-yellow hair, which on third segment is mixed with minute black hairs; clove-brown bands on fifth and sixth segments rounded off or tapering on each side, band on sixth segment not reaching lateral margins; seventh segment also with a dark brown transverse band in front (largely concealed beneath hind margin of preceding segment), not extending to lateral margins, but somewhat deeper on each side of middle line; distal extremity of venter banded similarly to *dorsum*; ventral surface of segment which is the first visible on dorsal side and that of next two segments cream-buff or buff, clothed with similarly coloured appressed hairs; clove-brown

transverse band on ventral plate of following segment obsolete in one specimen except on each side; ventral plate of seventh segment clove-brown except hind border and lateral margins. *Wings* somewhat paler towards hind margin, stigma ochraceous, veins tawny. *Squamæ* buff. *Halteres* cream-buff, stalks brownish or ochraceous-buff. *Legs*: coxæ dusky, grey pollinose, clothed with straw-yellow hair; femora clothed with black hairs, mixed, at least in case of middle and hind femora, with some yellow hairs; tibiæ and tarsi clothed with buff-yellow hair.

Northern Nigeria; type and one other specimen from South Bornu, September, 1907 (*Dr. H. A. Foy*). The donor's field-note is as follows:—"Attacking horse; sucked blood on the wing without settling, and darted away after feeding."

Pangonia concitans may be distinguished from *P. rüppellii*, Jaenn., which also occurs in Northern Nigeria, *inter alia* by the face being shorter, by the proboscis (including the labella) being shorter and thicker, by the pale bands on the hind borders of the distal abdominal segments being buff-yellow and clothed with chrome-yellow hair, instead of whitish and clothed with similarly coloured or yellowish-white hair, and by the absence of a posterior median notch in the dark band on the fourth abdominal segment.

Genus CADICERA, Macq.

Cadicera nigricolor, sp. n.

♀.—Length (1 specimen) 15 mm.; width of head 5 mm.; width of front at vertex 0.75 mm.; length of proboscis 3.75 mm.; greatest width of abdomen (third segment) 8 mm.; length of wing 14.8 mm.; greatest width of wing 5.5 mm.

Body entirely black, clothed with black hair, and totally devoid of lighter markings; wings dark brown, with a purplish tinge; legs varying in colour from clove-brown or almost black to dark chestnut-brown, and clothed with black hair except on inside of front tibiæ, where a longitudinal streak extending from base almost to distal extremity is composed of minute, appressed, buff-yellow hairs.

Head: front clove-brown, face dark Vandyke-brown, thinly clothed on each side with dark brown hairs, traces of grey pollen on antennal protuberance and on sides of face next eyes; basi-occipital region clothed with black hair; *palpi* dark Vandyke-brown, proximal joint clothed below with long, fine, blackish hair, terminal joint elongate, 2.25 mm.

in length in case of type, thickened just beyond middle, but less swollen than in certain other species of *Cadicera*, clothed with black hair; *proboscis* clove-brown; first and second joints of *antennæ* clove-brown, clothed with black hair (third joint missing in case of type). *Thorax*: dorsum shining, pleuræ and pectus dull. *Abdomen* purplish black, somewhat less shining than dorsum of thorax owing to surface being more coarsely punctured at base of each hair, and also scored with fine transverse striæ. *Wings*: costal cells darker than remainder of surface, anal and axillary cells paler, remaining cells each with a more or less pronounced paler central area or streak; veins clove-brown. *Squamæ* and *halteres* clove-brown. *Legs*: front legs and middle tibiæ and tarsi dark chestnut-brown.

Southern Rhodesia: Chirinda Forest, Melsetter District, 3800 ft., 1. x. 1909 (*C. F. M. Swynnerton*).

From all species of *Cadicera* already described except *C. crassipalpis*, Macq., *C. nigricolor* is at once distinguished by its uniform black colour, which is unrelieved by lighter markings of any kind. The less elongate and relatively broader abdomen, and the coloration of the antennæ, wings, tibiæ, and tarsi differentiate the new species from *C. crassipalpis*.

Genus CHRYSOPS, Meigen.

Chrysops laticeps, sp. n.

♀.—Length (1 specimen) 8 mm.; width of head 3.2 mm.; width of front at vertex 1.6 mm.; length of wing 8 mm.

A stoutly built thickset species, with broad head and sharply defined, narrow, oblique, transverse band on wings.—Head cream-buff pollinose, smoke-grey on vertex; antennæ relatively short; thorax yellowish-grey pollinose, dorsum in front with two narrow, admedian, buff-coloured longitudinal stripes, widely separated and not or scarcely extending beyond transverse suture; abdomen ochraceous-buff at base, dorsum of second to seventh segments inclusive each with a clove-brown transverse band, hind borders of these segments yellowish grey or yellowish pollinose, last three segments and hind borders of third and fourth segments thickly clothed above with ochre-yellow hair; legs, except middle and hind coxæ and tips of tarsi, cinnamon, hind tibiæ fringed on outer side with ochre-yellow hair.

Head: frontal callus shining black, transversely elliptical, but not extending to eyes; ocelli widely separated, each ocellus situate upon a small shining black spot; these spots are separate from each other, and the foremost spot is not

connected with the frontal callus ; face broad and relatively flat, not tumid or prominent ; *facial tubercles* in the shape of a vertically elongate, rectangular, shining clove-brown spot below each antenna ; *eyes* large, descending to lower margin of head, no shining spot on jowls ; face, jowls, and upper half of front clothed with fairly long, pale yellowish hair ; *palpi* ochraceous-buff, proximal joint clothed below with long buff-yellow hair, terminal joint moderately large, its proximal portion fairly broad, and its outer surface clothed with short, appressed, buff-yellow hairs, and dark brown in centre ; *antennæ* 2.5 mm. long, first two joints of approximately equal length and each about three-fourths as long as third joint, first and second joints cylindrical and of equal thickness, clothed with short black hair, first joint not incrassate, second and third joints dark brown, second joint paler (cinnamon) on inner side, first joint cinnamon, brownish at tip on upper side. *Thorax* : dorsum on each side with a broad yellowish pollinose stripe extending from humeral to post-alar callus ; dorsum (including scutellum) clothed with erect pale straw-yellow hair ; pleuræ yellowish pollinose, clothed with straw-yellow hair. *Abdomen* : ochraceous-buff area at base of dorsum extending to distal angles of second segment ; first segment with a clove-brown, median, quadrate blotch, extending beyond scutellum, but not reaching hind margin of segment ; clove-brown transverse band on second segment in contact with front margin in centre, but curving away from front margin on each side and diminishing in depth, somewhat emarginate posteriorly in middle line, separated from hind margin of segment by a space equal to about one-fourth of the length of latter, and not or only indistinctly reaching lateral margins of segment ; clove-brown bands on five following segments each in contact with anterior margin throughout their extent, separated from hind margin by roughly one-third of length of segment in each case, tapering somewhat towards each side, and not quite reaching actual lateral margins of segments ; bands on second to fourth segments inclusive clothed, except on sides, with short dark brown hair ; sides of first segment clothed with straw-yellow hair, those of second and third segments clothed with short, appressed, buff-yellow hair ; hair on extreme lateral margins longer, forming a fringe ; venter ochraceous-buff, clothed with appressed buff-coloured hair, second segment with an ill-defined, dark, transverse band in middle, not reaching sides, anterior borders of following segments infuscated. *Wings* : extreme base, costal border above and as far as end of first longitudinal vein, stigma, and

transverse band mummy-brown; transverse band extending obliquely backwards from first longitudinal to posterior branch of fifth vein, base of its proximal margin on a level with base of third longitudinal vein, that of its distal margin on a level with distal extremity of stigma, band narrowing until it reaches base of fifth posterior cell, in which, as also in discal cell, it is somewhat emarginate on its outer side; veins mummy-brown, in places ochraceous-buff. *Halteres*: knob dark brown, stalk cinnamon. *Legs*: middle and hind femora clothed with maize-yellow hair, long and fine below; front tibiae stout, but not incrassate, distal two-thirds brownish; last four joints and distal extremity of first joint of each tarsus dark brown.

Zululand: Kosi Bay, February–March, 1906 (*F. Toppin*: presented by Mr. E. Warren, Government Museum, Pietermaritzburg, Natal).

With *Chrysops fuscipennis*, Ricardo (Mashonaland and Nyasaland Protectorate), *C. ciliaris*, Lw. (the type of which was stated by its author to be from "Caffraria"), and the new species from Northern Nigeria described below, *C. laticeps* forms a well-defined group, recognizable at once by the sharply defined and characteristic wing-markings (which are without an apical blotch on the distal portion of the costa), as well as by the general *facies*, including the broad head, broad and thickset body, and fringed hind tibiae. From *C. ciliaris*, Lw., *C. laticeps* may be distinguished *inter alia* by the abdominal markings, the bands on the third and following segments being entire instead of widely interrupted in the middle line; from *C. fuscipennis*, Ricardo, the new species is distinguishable by its shorter antennae, differently shaped ocellar spots, and conspicuous bands of ochre-yellow hair on the dorsum of the abdomen. Owing to its small size and dusky coloration, especially its dark abdomen and legs, the following species cannot possibly be confused with *C. laticeps*.

Chrysops pusillula, sp. n.

♀.—Length (1 specimen) 5 mm.; width of head 2 mm.; width of front at vertex 1.2 mm.; length of wing 5.2 mm.

A very small dusky species, with sharply defined wing-markings of the same type as those of C. laticeps (no apical blotch on costa).—Head smoke-grey, pollinose, front mouse-grey; thorax mouse grey, pollinose, except median third of dorsum, which is light grey; dorsum of thorax in case of type with a pair of elevated and widely separated shining black

longitudinal stripes, interrupted on transverse suture; abdomen clove-brown, clothed above with relatively long and mainly dark brown hair, hind borders of first and second segments light grey; legs entirely clove-brown, front tibiæ slender, not at all incrassate, hind tibiæ stouter, bearing on outer side a fringe of long and fine dark brown hair, inner surface of hind tibiæ with a shorter and less conspicuous fringe.

Head: front broad, *frontal callus* large, shining black, semicircular in outline (lower margin straight), not extending to eyes; *ocelli* close together, anterior ocellus in contact with upper margin of callus, a transversely elongate shining black fleck extending outwards from each of the other ocelli, but not reaching eye; face slightly arched, but not prominent, an irregularly quadrate, shining black *facial tubercle* below each antenna, each tubercle (in typical specimen, at any rate) in contact with its fellow in middle line above; *eyes* large, descending to lower margin of head, no shining spot on jowls; upper half of front and middle part of face clothed with brownish hair, jowls clothed with yellowish hair, hair on face and jowls long and erect; *palpi* dark brown, terminal joint curved, not swollen at base; *antennæ* short, dark brown, first and second joints cylindrical, clothed with brownish hair (third joint missing in case of type), first joint not swollen, but thicker and somewhat longer than second, combined length of first two joints in case of type 1 mm. *Thorax*: *pleuræ* clothed with brownish hair; *scutellum* clove-brown. *Abdomen*: grey hind border of second segment narrow, of uniform depth, occupying about distal seventh of segment; grey hind border of first segment deeper on sides than in middle (at least twice as deep as hind border of second segment); extreme hind margins of third to sixth segments inclusive narrowly lighter (yellowish pollinose); a small patch of yellowish hair in middle of hind borders of first and second segments; terminal segment clothed with yellowish hair above and below; venter dark brown, clothed (except terminal segment) with brownish hair. *Wings* hyaline, extreme base, costal border above and as far as end of first longitudinal vein, and a sharply defined, oblique, transverse band, resting on distal third of first longitudinal vein and extending into anal cell, just beyond posterior branch of fifth vein, dark brown; transverse band crossing wing in such a way as to leave approximately distal third of discal cell hyaline; proximal and distal margins of transverse band roughly straight, without a projection or conspicuous indentation; centre of discal cell somewhat lighter; veins brown. *Halteres*: knob russet-brown, stalk dark

brown. *Legs*: femora clothed beneath with long and fine brownish hair.

Northern Nigeria: S. Bornu, between September and December, 1908 (Dr. H. A. Foy).

As stated above, at the end of the description of the foregoing species, *Chrysops pusillula* belongs to the well-marked group which also includes *C. ciliaris*, Lw., *C. fuscipennis*, Ricardo, and *C. laticeps*, Austen, from all of which it can readily be distinguished by its small size and by its dark-coloured abdomen not being lighter at the base.

Chrysops inflaticornis, sp. n.

♀.—Length (3 specimens) 8 to 9.5 mm.; width of head 2.75 to 3 mm.; width of front at vertex 1.2 mm.; length of wing 8 to 8.75 mm.

Dorsum of thorax marked alternately with greyish olive-brown and smoke-grey longitudinal stripes; abdomen ochraceous-buff, dorsum of second and following segments each with a more or less indistinct russet-brown transverse band, second to fifth segments inclusive each with hind margin and a median triangle on hind border pale; first and second joints of antennæ shining tawny ochraceous, first joint strongly swollen, elliptical-oval; wings with costal border and sharply defined, oblique, transverse band, tapering towards hind border, mummy-brown, apical blotch on costa present and below it a fainter infuscation, including tip of wing and extending along hind border as far as axillary cell and anal angle, meeting transverse band in fourth or fifth posterior cell; legs ochraceous, none of the tibiæ incrassate, hind tibiæ with a fringe of short hair on outer side.

Head broad, cream-coloured pollinose, upper half of front yellowish pollinose; front broad, frontal callus either clove-brown, raw-sienna-coloured in centre above, or raw-sienna-coloured, clove-brown on lower margin and towards each lateral extremity; frontal callus fairly prominent, in shape a wide and low triangle, with apex directed upwards and blunt, and the lateral angles rounded off and either in contact with or only narrowly separated from the eyes; ocelli somewhat widely separate, each ocellus surrounded by a small dark brown spot, the spot encircling each upper ocellus sometimes taking the shape of a narrow triangular streak, extending outwards towards eye; face broad, somewhat arched and prominent, facial tubercles wanting, no shining spot on jowls; front, face, jowls, and lower surface of head clothed with erect yellowish hair, longest below; palpi clothed with

similar hair, proximal joint dark grey, terminal joint cream-buff, bluntly lanceolate in outline, not curved; first and second joints of *antennæ* clothed with short blackish hair, first joint with a dark brown longitudinal streak on outer side of distal half, second joint dark brown at extreme tip (third joint missing in specimens available for examination). *Thorax*: dorsum marked with three greyish olive-brown and four smoke-grey longitudinal stripes, and also with a small, elongate, dark grey streak on each side above base of wing; pleuræ light grey, clothed with whitish hair; dorsum, including scutellum, clothed with short yellowish hair; *scutellum* cinnamon-rufous, its base marked with a transversely elongate greyish olive-brown spot, not extending to sides. *Abdomen*: dorsum of first segment with a clove-brown median area beneath scutellum, not or scarcely reaching hind margin; dorsum of second segment with a small, rounded, greyish olive-brown or blackish spot in middle line near front margin; darker bands on dorsum extending to sides in case of third and fourth segments, band on fifth segment sometimes reaching sides, bands on second and last two segments not extending to sides; bands on third and following segments in each case in contact with front margin throughout their extent, band on second segment in contact with front margin in middle line, but curving away from it towards each side; paler areas on dorsum, including posterior angles and hind margin of first segment, anterior angles of second segment, hind borders of second to sixth segments inclusive, and posterior median triangles on second to fifth segments inclusive clothed with minute, glistening, appressed, yellowish hairs; darker areas of dorsum clothed with minute, appressed, blackish hairs; *venter* buff, clothed with minute, appressed, yellowish hairs, second segment sometimes with a small, dark, median spot, similar to that on dorsum of same segment. *Wings*: mummy-brown costal border deeper towards base of wing, and including, besides base of wing itself, proximal extremities of first and second basal cells; *stigma* when seen against a light background cinnamon or tawny-ochraceous; proximal margin of transverse band commencing on a level with base of third longitudinal vein, approximately straight, distal margin of transverse band commencing halfway between distal extremity of stigma and proximal end of apical blotch, notched, sending out a projection to base of fork of third longitudinal vein, and also indented below distal extremity of discal cell; transverse band terminating in distal extremity of anal cell; costal border indented in marginal cell by upper extremity of a

milky streak, which borders distal margin of transverse band as far as fourth posterior cell, separating apical blotch and infuscation below it from transverse band. *Halteres* dark brown, knobs paler below. *Legs* : coxæ clothed with whitish hair, middle and hind coxæ grey, front coxæ buff, grey at the tip ; trochanters, tips of femora and of first joint of each tarsus, and last four joints of each tarsus except at extreme base dark brown, front tibiæ brownish at distal extremity ; femora clothed with pale yellowish or whitish hair, tibiæ clothed with short blackish hair, hind tibiæ also with short yellowish hair on outer side at base.

Cape Colony : type and two other specimens from Annshaw, King William's Town District (*Miss Barrett*).

The coloration of the antennæ and their swollen first joints, in conjunction with the sharply defined wing-markings, will suffice to distinguish this species from any other African *Chrysops* at present known.

Genus RHINOMYZA, Wied.

Rhinomyza perpulcra, sp. n.

♀.—Length (6 specimens) 12.25 to 12.6 mm. ; width of head 4 to 4.2 mm. ; width of front at vertex 0.5 to 0.6 mm. ; length of wing 11.8 to 12 mm.

Dorsum of thorax mummy-brown, unicolorous ; *dorsum of abdomen* tawny-ochraceous, with two broad, black, longitudinal stripes, either entire or more or less incomplete after reaching hind margin of third segment ; *pleuræ*, *pectus*, and *venter* buff, without markings ; both upper and lower branches of third joint of antennæ long and slender ; *wings* with a yellowish tinge, especially in proximal half ; costal border, including distal extremity down to level of posterior branch of third longitudinal vein, first basal and proximal two-thirds of second basal cell, and a broad transverse band, starting from costal border below stigma, extending to posterior margin, and curving back into tips of anal and axillary cells, clove-brown.

Head orange-buff, front immediately above base of antennæ and prominent central portion of face darker (tawny or tawny ochraceous), the latter more or less shining ; elongate, shining *frontal callus* shaped as in *Rh. denticornis*, Wied., tawny, with upper half dark brown, or at least with a dark brown spot above middle ; ocellar spot dark brown, connected with upper extremity of callus ; lower surface of head clothed with buff-yellow hair ; proximal joint of *palpi* orange-buff, clothed with buff-yellow hair, terminal joint

mummy-brown or dark tawny, clothed on outer side with minute, appressed, black hairs; *antennæ* ochraceous or tawny, tip of third joint (last four annuli) clove-brown or black, first two joints clothed with minute black hairs, upper angle of second joint much produced, third joint 1·8 mm. in length, its upper branch 1 mm. in length, very slender at its distal extremity, which is curved downwards. *Thorax*: extreme front margin of dorsum showing vestiges of two paler, elongate, admedian flecks, dorsum clothed with brownish, pleuræ with buff-yellow or maize-yellow hair. *Abdomen*: black longitudinal stripes on dorsum commencing on first segment, and, if extending to distal extremity, sometimes more or less confluent on fifth and sixth segments; in other specimens stripes are interrupted on front half of fourth segment, commencing again more or less indistinctly towards hind margin of same, and thence being continued to tip of abdomen, although by no means so sharply defined as on first three segments; inner margins of stripes more or less excavated on each segment after first and consequently irregular; though widely separated from lateral margins on first two segments, stripes are more or less connected therewith on third segment, and also on following segments when stripes are prolonged to the tip; light parts of dorsum clothed with minute orange-buff hairs, more or less intermixed with minute black hairs, with which alone the black stripes are clothed; venter shining, clothed with minute, appressed, buff-yellow or orange-buff hairs. *Wings*: dark markings sharply defined and very conspicuous; costal border narrowest immediately before stigma, which is dark brown; apical blotch (extension of costal border) terminating sharply on posterior branch of third longitudinal vein, and so wide as to occupy distal three-fourths of second submarginal cell; distal margin of transverse band commencing on (occasionally just above) second longitudinal vein, at a point about two-thirds of distance between distal extremity of stigma and apical blotch; proximal margin of transverse band commencing a little beyond level of proximal end of stigma, indented in discal cell, and again, and more deeply, in fifth posterior cell; first basal cell with a minute, elongate, hyaline streak or spot in extreme base, next upper margin; fourth longitudinal vein passing through an elongate, hyaline streak just before meeting anterior basal transverse vein. *Halteres*: knobs clove-brown, sometimes paler (buff or ochraceous-buff) below, or above and below; stalks buff or ochraceous-buff. *Legs* ochraceous or tawny-ochraceous; coxæ buff; front tarsi and last joints of middle and hind

tarsi black or clove-brown, third and fourth joints of middle tarsi and second, third, and fourth joints of hind tarsi dark brown; a longitudinal streak on distal portion of postero-interior surface of front tibiæ, tips of first and second joints of middle tarsi, and tip of first joint of hind tarsi on posterior side brown or brownish; coxæ and front and middle femora clothed with buff-yellow hair, tibiæ, hind femora, and first joint of hind tarsi clothed with orange-ochraceous hair.

Uganda: type and five other specimens from Mpumu, Chagwe, April, 1910 (*Captains A. E. Hamerton, D.S.O., R.A.M.C., and H. R. Bateman, R.A.M.C.*).

Captain Bateman has kindly supplied the following field-note on this strikingly handsome species:—

“*Habitat*:—ford across stream bordered by forest at foot of north aspect of Mpumu Hill.

“*Dates when caught*:—April 14, 18, and 22, 1910.

“*Average climatic conditions*:—heavy rain-storms during night, followed by bright sunshine and showers during day. Temperature 60°–80° F.

“*Habits* (so far as observed):—most active from sunrise (6.0 A.M.) to 9.0 A.M. on bright mornings; absent during rainy mornings; active again from 4.0 P.M. to 5.0 P.M.; not to be seen at mid-day. The flies are found flying low over the running stream, and alighting from time to time on the stones in the water. They attack man and beast during their active hours, and bite freely.

“*Numbers*:—fairly common.

“*Eyes in fresh state* iridescent black, or rather iridescent gun-metal colour.”

The following are the chief points of difference from the South African *Rhinomyza denticornis*, Wied., presented by *Rh. perpulcra*:—third joint of antennæ (both upper and lower branches) longer and more slender; dorsum of thorax uniformly darker, without any trace of longitudinal stripes, except two admedian light flecks on extreme front margin; no longitudinal dark stripe, either partial or complete, on lateral edge of dorsum of thorax and lateral edge of abdomen; black stripes on dorsum of abdomen much broader; wings with apical blotch reaching lower branch of third longitudinal vein (instead of extending at most to middle of second submarginal cell), and transverse band connected with blotch at tip of anal cell; front tarsi entirely and tips of middle and hind tarsi black or clove-brown, instead of only tips of all tarsi being brown or brownish.

Rhinomyza concinna, sp. n.

♀.—Length (1 specimen) 12 mm. ; width of head 4 mm. ; width of front at vertex 0.6 mm. ; length of wing 12 mm.

Dorsum of thorax cinnamon-coloured, yellowish-pollinose, with a pair of ill-defined, ochraceous-buff, admedian, longitudinal stripes, and a dark brown, median, longitudinal stripe, commencing just before level of transverse suture, very narrow for about 1.5 mm. and then suddenly expanding into an oblong blotch reaching hind margin ; on each side of dorsum of thorax an elongate dark brown mark, between humeral callus and base of wing ; dorsum of abdomen orange-buff, darker towards distal extremity, last three segments mainly chestnut-brown, first segment with a narrow clove-brown band of nearly uniform depth on hind border, second segment with an irregular clove-brown triangle on hind border, each lateral extremity of which is connected with one of a pair of clove-brown transverse blotches, one of which is situated on each side of third segment ; wings not quite hyaline (faintly tinged with sepia), with conspicuous mummy-brown markings.

Head buff-yellow (occipital region smoke-grey), frontal callus ochraceous, shining central portion of face tawny-ochraceous, ocellar spot and a quadrate median spot immediately above lower margin of face clove-brown ; under surface of head clothed with ochraceous hair ; *palpi* tawny, terminal joint clothed on outer side with minute, appressed, black hairs ; *antennæ* tawny-ochraceous, first and second joints clothed with minute blackish hairs, upper angle of second joint much produced, third joint long and slender, darker towards distal extremity and end of last annulus brown, but (in typical specimen at any rate) no sharply defined clove-brown or black tip to third joint, upper branch of third joint much as in *Rh. denticornis*, Wied., not remarkably elongate, and only about half the length of upper branch in case of foregoing species. *Thorax* : dorsum clothed with short buff-yellow hair (on lateral dark brown marks with brown hair) ; *pleuræ* buff pollinose, clothed with yellowish-white hair ; *pectus* dark brown, grey pollinose. *Abdomen* (dorsal surface) : first segment clothed with ochre-yellow hair, second and following segments clothed for most part with minute, appressed, blackish hairs, sides of second segment also with ochre-yellow hair ; clove-brown band on first segment somewhat narrower at each side, apex of triangle on second segment reaching to about the middle, clove-brown blotches on third segment somewhat triangular in shape (at any rate in typical specimen), base of each triangle resting on lateral margin of

segment and its apex pointing towards middle line, the space separating the apices equal to about one-fourth of total width of segment, lateral triangles in contact with front margin of segment for more than half their extent, but not quite reaching hind margin. *Wings*: mummy-brown markings of same type as wing-markings of foregoing species, but transverse band not connected with mummy-brown streak in apex of anal cell, and apical blotch not reaching posterior branch of third longitudinal vein; extreme base and costal cells raw sienna-coloured, proximal extremity of second costal cell tinged with mummy-brown; *stigma* ochraceous, its distal extremity mummy-brown; in proximal half of wing a mummy-brown blotch extends obliquely across bases of first and second basal cells and anal cell, and is narrower in latter, in first basal cell leaving usual minute, elongate, hyaline streak in extreme base next upper margin; there is also a transverse mummy-brown streak in apex of anal cell, next posterior branch of fifth vein; in distal half of wing mummy-brown transverse band, starting from hind margin in fourth posterior cell and overflowing somewhat into fifth posterior cell, runs obliquely forwards to costa, along which it is continued into second submarginal cell; proximal margin of transverse band runs at first in fifth posterior cell, nearly parallel to posterior intercalary vein; crossing latter and fourth posterior cell at a point about one-fourth of their length from base, it is indented in discal cell, and reaches stigma at a point about one-third of the length of the latter from its proximal extremity; distal margin of transverse band (in typical specimen at any rate) slightly sinuous, bulging forwards in first posterior cell, and turning towards tip of wing just below second longitudinal vein; apical blotch reaching not quite half-way into second submarginal cell; costa, auxiliary, and first longitudinal veins mummy-brown, other veins ochre-yellow or orange-buff, mummy-brown in portions included in dark markings. *Halteres*: knobs russet-brown, stalks buff. *Legs*: front coxæ ochraceous-buff, pollinose, clothed with pale yellowish hair; femora and middle and hind coxæ mummy-brown, former clothed with ochreous hair, tips of femora cinnamon; front tibiæ ochraceous-buff, darker at distal extremity, hind tibiæ buff, tawny-ochraceous at extreme tip on inner side (middle tibiæ and tarsi wanting in case of type); last four joints of front tarsi dark brown, first joint brown, lighter (tawny) at base; hind tarsi buff, last two joints and extreme tips of first three joints cinnamon-rufous; front tibiæ clothed with

minute, appressed, maize-yellow hair, hind tibiæ and tarsi clothed with Naples-yellow hair.

Nyasaland Protectorate: West Nyasa, 1909 (*Dr. H. S. Stannus*): presented by the Entomological Research Committee (Tropical Africa).

Although somewhat resembling the South African *Rhinomyza denticornis*, Wied., in the colour of its wing-markings, *Rh. concinna* can at once be distinguished by the nature and character of the markings on the abdomen, on which longitudinal stripes are entirely absent; the presence of a clove-brown band on the first abdominal segment, apart from the dark spot on the face and various differences in the wing-markings, will serve to distinguish *Rh. concinna* from the following species.

Rhinomyza stimulans, sp. n.

♀.—Length (1 specimen) 11 mm.; width of head 3.6 mm.; width of front at vertex 0.5 mm.; length of wing 10.6 mm.

Dorsum of thorax raw-sienna coloured, entirely unicolorous, without markings; dorsum of abdomen orange-ochraceous, with clove-brown markings,—a deep transverse band, not reaching lateral margins and interrupted in middle line, occupying third segment and extending on to posterior third of second segment, and a roughly horseshoe-shaped mark, also not reaching lateral margins, with concavity directed forwards, occupying fifth and sixth segments and forming a transverse band on posterior half of fifth; wings faintly tinged with sepia, and exhibiting conspicuous dark brown markings.

Head: front buff-yellow, sides of face and jowls cream-buff, occiput smoke-grey; frontal callus and shining, tumid, central portion of face ochre-yellow; ocellar spot dark brown, face unspotted; under surface of head clothed with pale yellowish hair; proximal joint of *palpi* buff, terminal joint ochraceous-buff, clothed on outer side with minute, appressed, brown or dark tawny hairs; *antennæ* ochraceous-buff, first and second joints clothed with minute brown hairs, upper angle of second joint moderately produced, third joint with apical annuli black and with very long upper branch. *Thorax*: dorsum clothed with buff-yellow hair; pleuræ and pectus cream-buff, clothed with pale yellowish hair. *Abdomen*: dorsum clothed for most part with ochre-yellow hair, on dark markings with dark brown hair; anterior margin of interrupted transverse band on second and third segments curved, with convexity directed forwards, inner

margins of band emarginate on third segment (at least in typical specimen); anterior extremities of horseshoe-shaped mark visible through hind margin of fourth segment (at least in case of type), so that on a cursory inspection this segment appears to have two small dark blotches on its hind margin; venter shining ochraceous-buff, without markings, clothed with appressed ochre-yellow hair. *Wings*: markings of same general type as in previous species, but transverse band narrower, and apical blotch reaching posterior branch of third longitudinal vein; extreme base and costal cells mummy-brown, remaining markings and *stigma* dark sepia-coloured or clove-brown; "remaining markings" occupy apex of anal cell, proximal two-fifths of second basal and rather more than proximal half of first basal cell, and also include transverse band and its extension along costa and into second submarginal cell; first basal cell with usual, minute, hyaline streak at its extreme base; dark brown blotch in apex of anal cell slightly overflows sixth longitudinal vein into axillary cell; transverse band starts from hind margin of wing in lower distal angle of fifth posterior cell, passes over posterior transverse vein and is indented in discal cell, then becomes broader and reaches costa, its proximal margin meeting second longitudinal vein slightly basad of distal extremity of auxiliary vein, and its distal margin, which is indented in first submarginal cell, meeting second longitudinal vein slightly beyond level of distal extremity of *stigma*; from point at which proximal margin of transverse band meets second longitudinal vein to distal extremity of marginal cell latter is entirely dark brown, though (in typical specimen, at any rate) there are traces of an ill-defined paler area in marginal cell immediately above space separating transverse band from apical blotch; from distal extremity of marginal cell, costal extension of transverse band is continued downwards to form apical blotch, becoming broader immediately below second longitudinal vein (its proximal margin crossing anterior branch of third longitudinal vein at a point about one-fourth of the length of the branch from its base), and terminating on posterior branch of third vein; veins orange-ochraceous, costa, auxiliary, and first longitudinal vein, and other veins where covered by dark markings, dark brown or clove-brown. *Halteres*: knobs orange-buff, stalks buff. *Legs* buff-yellow or orange-buff; front tarsi clove-brown, last three joints and tips of first two joints of middle and hind tarsi mummy-brown.

Northern Nigeria : R. Benue, between Bagana and Lokoja, March, 1907 (*Dr. G. J. Pirie*).

The collector's field-note attached to the type is as follows :—

"Caught on a sand-bank in the evening, while we were sitting out by lamp-light : bit a European."

The present species may be distinguished from the foregoing (*Rh. concinna*, Austen) by the absence of markings on the thorax and of a dark transverse band on the first abdominal segment, as also by the band on the second (as well as that on the third) abdominal segment being interrupted in the middle line; as regards the wings, the markings in the distal half are darker in *Rh. stimulans* than in *Rh. concinna*, while the transverse band is narrower, and the apical blotch reaches the posterior branch of the third longitudinal vein, instead of terminating a little before the middle of the second submarginal cell.

Rhinomyza stimulans is closely allied to a new species of the same genus found in Southern Nigeria, of which a ♀ from Agbabu, S. Nigeria, 23. iv. 1909 (*Dr. Hannington*), is in the possession of the Liverpool School of Tropical Medicine. Apart from its larger size (length 13.5 mm., wing-expanse 26.3 mm.), the Liverpool specimen is distinguished by its darker colour (dorsum of thorax mummy-brown), dark brown antennæ, shorter and stouter first antennal joint, second antennal joint having its upper angle much more produced (continued into a long point), and, in the wing, by the brown blotch in the tip of anal cell extending to the hind margin and filling up rather more than the distal third of the axillary cell. In the shape of the frontal callus, general pattern of the wing-markings, and general shape and extent of the dark bands on the abdomen the two species are alike.

XXXIX.—*Descriptions and Records of Bees*.—XXXIII.

By T. D. A. COCKERELL, University of Colorado.

Callomelitta turnerorum, sp. n.

♀.—Length about $7\frac{1}{2}$ mm.

Thorax, legs, and abdomen entirely bright rufo-fulvous; head black, with the lower margin of clypeus, labrum, and the bidentate mandibles ferruginous; antennæ fulvous, the